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(54) Title: **MOLECULAR ANTIGEN ARRAYS AND VACCINES**

(57) Abstract: The invention provides compositions and processes for the production of ordered and repetitive antigen or antigenic determinant arrays. The compositions of the invention are useful for the production of vaccines for the prevention of infectious diseases, the treatment of allergies and the treatment of cancers. Various embodiments of the invention provide for a core particle that is coated with any desired antigen in a highly ordered and repetitive fashion as the result of specific interactions.

INTERNATIONAL SEARCH REPORT

International Application No
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A. CLASSIFICATION OF SUBJECT MATTER		
IPC 7 A61K39/385 A61P37/00 //C12N15/33,C12N15/51,C12N15/31, C12N15/30,C12N15/62,C07K14/245,C07K14/02,C07K19/00		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols) IPC 7 A61K		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practical, search terms used) EPO-Internal, WPI Data, BIOSIS		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 578 293 A (AKZO NV) 12 January 1994 (1994-01-12) page 3, line 35 – line 58 ----	1-5, 11-15, 45-60, 79,80, 83-85
A	BACHMANN M F ET AL: "The influence of virus structure on antibody responses and virus serotype formation" IMMUNOLOGY TODAY, vol. 17, no. 12, 1 December 1996 (1996-12-01), pages 553-558, XP004071007 ---- -/-	
<input checked="" type="checkbox"/> Further documents are listed in the continuation of box C.		<input checked="" type="checkbox"/> Patent family members are listed in annex.
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Date of the actual completion of the international search	Date of mailing of the international search report	
25 February 2002	05/03/2002	
Name and mailing address of the ISA European Patent Office, P.B. 5818 Palentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer Teyssier, B	

INTERNATIONAL SEARCH REPORT

International Application No

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P, X	WO 00 32227 A (CYTOS BIOTECHNOLOGY AG) 8 June 2000 (2000-06-08) the whole document -----	28-44, 48-56, 61,62, 78-80, 83-85

FURTHER INFORMATION CONTINUED FROM PCT/SA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-27, 45-47, 57-60, 63-77, 81,
82 (in totality); 48-56, 61, 62, 78-80,
83-85 (partially)

Compositions comprising a bacterial pili covalently linked to an antigen; methods of making these compositions; methods of immunisation using these compositions.

2. Claims: 28-44 (in totality); 48-56, 61, 62, 78-80,
83-85 (partially)

Compositions comprising a virus-like molecular scaffold; methods of making these compositions; methods of immunisation using these compositions.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No	
PCT/IB 01/00741	

Patent document cited in search report	Publication date		Patent family member(s)	Publication date
EP 0578293	A	12-01-1994	EP 0578293 A1 ES 2142848 T3 GR 3033086 T3 AT 188737 T AU 4134393 A BR 9302408 A CA 2098533 A1 DE 69327553 D1 DE 69327553 T2 DK 578293 T3 HU 68554 A2 JP 6056696 A MX 303646 A1 NZ 247907 A PT 578293 T US 5684145 A US 6019983 A ZA 9304199 A	12-01-1994 01-05-2000 31-08-2000 15-01-2000 23-12-1993 11-01-1994 19-12-1993 17-02-2000 10-08-2000 26-06-2000 28-06-1995 01-03-1994 31-05-1994 22-12-1994 30-06-2000 04-11-1997 01-02-2000 10-01-1994
WO 0032227	A	08-06-2000	AU 1402000 A BR 9915771 A CN 1333693 T EP 1135162 A2 WO 0032227 A2	19-06-2000 26-12-2001 30-01-2002 26-09-2001 08-06-2000